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ABUNDANCE, AGE, SEX, AND SIZE OF SALMON (Oncorhynchus spp.) CATCHES AND ESCAPEMENTS IN THE KUSKOKWIM AREA, 1982

By:
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April 1984

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Don W. Collinsworth
Commissioner

ADF&G TECHNICAL DATA REPORTS

This series of reports is designed to facilitate prompt reporting of data from studies conducted by the Alaska Department of Fish and Game, especially studies which may be of direct and immediate interest to scientists of other agencies.

The primary purpose of these reports is presentation of data. Description of programs and data collection methods is included only to the extent required for interpretation of the data. Analysis is generally limited to that necessary for clarification of data collection methods and interpretation of the basic data. No attempt is made in these reports to present analysis of the data relative to its ultimate or intended use.

Data presented in these reports is intended to be final, however, some revisions may occasionally be necessary. Minor revision will be made via errata sheets. Major revisions will be made in the form of revised reports.

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Alaska Department of Fish and Game
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FOREWORD

This presentation of Kuskokwim area salmon statistics is the first in a series of annual reports which will summarize available information regarding composition and abundance of inshore returns. The primary objective of this publication is to present the basic biological information collected by the Alaska Department of Fish and Game in 1982 during ongoing research and management-related investigations on salmon in the Kuskokwim, Quinhagak, and Goodnews Bay Districts. Included are commercial and subsistence catch data, available escapement estimates, and age and size composition estimates by sex. Detailed knowledge of these population attributes is required in order to accurately evaluate and manage for stock-specific production. Unfortunately, while Kuskokwim area catch information is largely known, the considerable number of spawning streams scattered throughout the immense Kuskokwim Bay and River drainages has always precluded a complete collection of escapement data. No attempt has been made to estimate total drainage escapements from the limited available spawner counts, nor to allocate catches to streams of origin. This document is therefore intended to serve only as a first step toward total run documentation and eventual stock-specific production evaluation.

ABSTRACT

Commercial and subsistence gillnet fisheries in the Kuskokwim area of western Alaska harvested all five species of Pacific salmon in 1982. A total of 141,163 chinook, 521,189 chum, 97,716 sockeye, 18,264 pink, and 615,233 coho salmon were caught in the Kuskokwim River, and in marine waters at the mouths of the Kanektok and Goodnews Rivers. Kuskokwim River commercial and subsistence-caught chinook salmon were primarily (62%) age 6_2. The major age class represented for three of the other four species harvested were: chum, 67% age 4_2; sockeye, 65% age 5_2; and coho, 94% age 4_3. Chinook salmon harvested in the Quinhagak District (Kanektok River mouth) were mostly (64%) age 5_2. Age 4_1 chum salmon were predominant (63%) while age 5_2 sockeye and age 4_3 coho salmon were most abundant (69% and 95%, respectively). Goodnews District chinook salmon consisted of mainly (67%) age 5_2 fish; chum salmon were primarily (53%) age 5_1, sockeye salmon were mostly (79%) age 5_2, and coho salmon were all age 4_3. Escapement of salmon to the Kuskokwim River were sampled for age, size, and sex data. Age composition of the escapement, with few exceptions, were similar to those of the catches.

KEY WORDS: catch allocation, chinook salmon, chum salmon, sockeye salmon, coho salmon, age classification, fishery synopsis.

INTRODUCTION

The Kuskokwim area includes five fishing districts located in or adjacent to three unique river systems. Three separate fishing districts are located within the confines of the mainstem Kuskokwim River (335-10, 20, 30), and the other two districts are located near the mouths of the Kanektok (335-40), and Goodnews Rivers (355-50), respectively (Figure 1). All three river systems support major annual runs of chinook salmon *(Oncorhynchus tschawytscha)*, chum salmon *(O. keta)*, and coho salmon *(O. kisutch)*. In addition, the Kanektok and Goodnews Rivers support significant annual runs of sockeye salmon *(O. nerka)* and even-year runs of pink salmon *(O. gorbuscha)*. The Kuskokwim River also occasionally supports significant runs of sockeye salmon, though catches of this species are largely incidental.

Nearly all of the commercial fishing occurs in the Lower Kuskokwim River District (W-11 or 335-10), the Quinhagak District (W-4 or 335-40), and the Goodnews Bay District (W-5 or 335-50). The Alaska Department of Fish and Game (ADF&G) presently conducts a number of activities to collect biological information on the salmon populations returning to these areas. Of major importance are efforts designed to collect information concerning: (1) the magnitude and timing of the commercial and subsistence harvest in each fishing district; (2) the age, size, and sex composition of each commercial catch component; (3) the timing and either absolute or relative magnitude of selected major spawning populations; and (4) the age, size, and sex composition of enumerated spawning populations. By documenting annual run characteristics, the ADF&G hopes to improve and standardize the salmon data base, and thereby facilitate management of discrete stocks within the production areas. Few studies to date have concentrated on critically evaluating Kuskokwim area production because of limited historic escapement and stock-specific catch data.

Available annual data presently include commercial catch statistics, subsistence harvest estimates, some escapement estimates, and age, sex, and size information. Commercial catch statistics are formally published by the ADF&G, Division of Commercial Fisheries (CF). Subsistence harvest estimates are generated by CF from information collected during autumn surveys, and are presented in the ADF&G Kuskokwim Area Annual Management Report series (ADF&G 1982). All available escapement information is maintained in a computerized stream catalog. Historic age, sex, and size data have been reported informally.

This report is a comprehensive presentation of currently available information on the abundance and age, size, and sex composition of Kuskokwim area salmon runs in 1982. Catch and escapement information is apportioned by age class, sex, and length within each species. Standard error and sample size statistics are included in this report. In those instances where site-specific information is unavailable, the catch or escapement is apportioned by average age, sex, and size data from segments of the population sampled in other locations. It should be noted that numerous small populations exist about which little or no information is available.

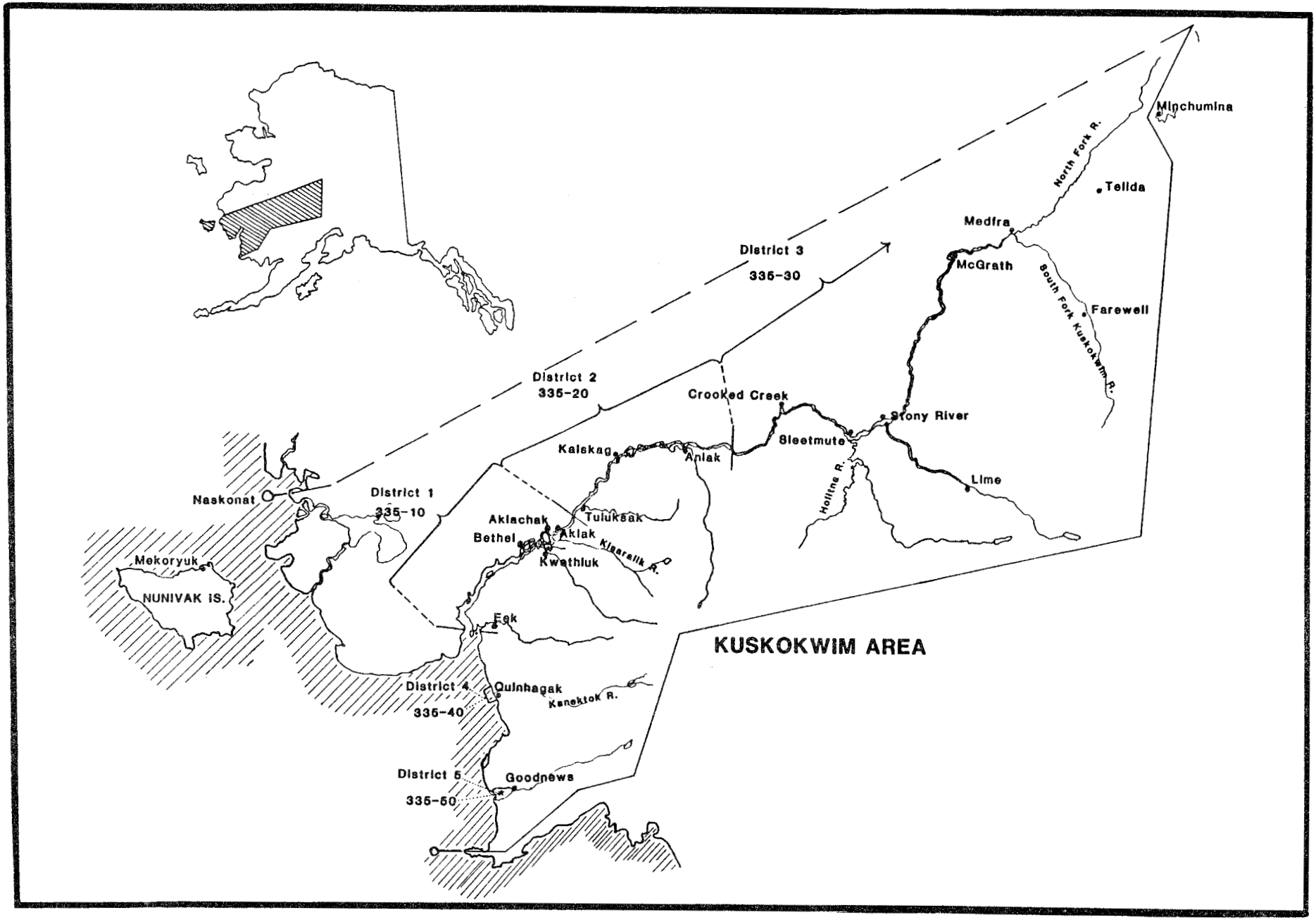

Figure 1. Map of the Kuskokwim Area showing commercial fishing district boundaries.

METHODS

Study Area Description

The Kuskokwim area consists of all waters draining into the area between Cape Newenham and Naskonat Peninsula, including Nunivak Island (Figure 1). Commercial fishing occurs in two separate fishing districts in the mainstem Kuskokwim River and in marine waters at the mouths of both the Kanektok and Goodnews Rivers. The Lower Kuskokwim River District (W-1) extends approximately 78 miles (125 km) from the lower end of Eek Island upriver to Bethel during most of the summer when chum and sockeye salmon predominate, and it extends an additional 44 miles (70 km) upriver to Mishevik Slough both early and late in the season when chinook and coho salmon are respectively more prevalent. The Middle Kuskokwim River District (W-2) extends from Mishevik Slough 123 miles (198 km) upriver to the mouth of the Kolmakof River above Aniak. District 4 is located near the village of Quinhagak at the mouth of the Kanektok River, and extends along the ocean shoreline for roughly 7 miles (4 km) from the mouth of Oyak Creek southward to the mouth of the Arolik River. The Goodnews District (W-5) is located within the confines of Goodnews Bay at the mouth of the Goodnews River.

Drift and set gill nets are the only legal commercial fishing gear allowed in the Kuskokwim area. Most commercial fishing has been conducted with drift gill nets in recent years. The maximum aggregate net length is 50 fathoms (90 m), and salmon may be taken in nets with stretch mesh sizes of not more than six inches (15 cm) after 25 June in the Kuskokwim River. Nets with mesh sizes larger than six inches (15 cm) may not be deeper than 35 meshes, and those with mesh sizes of six inches (15 cm) or less may not be deeper than 45 meshes. All commercial fishing in both the Quinhagak and Goodnews Bay Districts is limited to 50-fathom (90 m) six-inch (15 cm) stretch mesh gill nets or less. Subsistence fishing commonly occurs with the same gill nets used for commercial purposes. The gill net size most commonly used to harvest chinook salmon in the Kuskokwim River is 8-inch (20 cm) stretch mesh, whereas 5-1/2 inch (14 cm) stretch mesh is the standard for all other commercial and subsistence salmon fishing in the Kuskokwim area.

Abundance Data

All harvest data presented in this report were compiled by ADF&G in Bethel, Alaska. The commercial harvest data were tabulated from fish tickets, and are considered preliminary until final catch data are formally published by ADF&G. Final harvest figures are not expected to differ from the preliminary values by more than one percent.

Subsistence harvest data were estimated from subsistence surveys and returned catch calendars. Surveys were conducted door to door in 27 villages throughout the Kuskokwim management area in 1982. Interviews included retrieving ADF&G supplied catch calendars and any additional pertinent verbal information. Surveyed villages were censused, and information on non-respondent family participation in the subsistence fishery was gathered from neighbors. Data from interviewed families was then linearly expanded for the estimated number of non-reporting fishing families. Record keeping is voluntary however and there is little quality control during data collection in-season. Consequently, reported subsistence harvests are not as precise as commercial harvest information.

Escapement data presented in this report were collected in a variety of ways. These include visual observation from both a tower and a weir, hydroacoustic sensing by side-scanning sonar, and peak abundance aerial survey assessment. Of these, only weir counts on the Holitna River (Ignatti weir) and expanded tower counts on the middle fork of the Goodnews River are considered to represent total escapements. Sonar appears to accurately reflect fish presence within the ensonified water column, and is used to estimate fish passage on both the Kanektok and Aniak Rivers (Schultz and Carey 1982; Schneiderhan 1982). Other escapement information presented are from aerial stream surveys during presumed periods of peak abundance on selected spawning grounds under fair to good survey conditions. While it is not currently feasible to survey all of the small spawning tributaries within the Kuskokwim drainage, an attempt is made to census all of the known major salmon spawning concentrations to provide escapement indices for those systems.

Age, Sex, and Length Data

All salmon species except pink salmon were sampled for age, sex, and length statistics. Age was determined from scale samples taken from the peferred area on the left side of the fish, approximately two rows above the lateral line and on a diagonal between the posterior end of the dorsal fin and anterior end of the anal fin (INPFC 1963). All ages are reported using Gilbert-Rich notation signifying total and freshwater ages. Sex was determined from external morphological characteristics, except in the case of commercially caught chinook salmon which were usually sampled by examination of gonads. All reported lengths were taken mid-eye to fork of tail except for salmon sampled at Ignatti weir on the Kogrukluk River (a major tributary of the Holitna River); these fish were measured and reported as rear orbit to fork of tail.

Samples were collected from as many catch and escapement time and area strata as practical given budget limitations. Where possible, samples were collected throughout the duration of the salmon migration. Sampling effort was distributed through the period of commercial harvest of chinook, chum, and sockeye salmon runs in Districts 1, 4, and 5. The escapements of all species enumerated both at Ignatti weir and at the Aniak River sonar project were sampled throughout the run. Goodnews and Kanektok River system escapements, as well as subsistence catches were not sampled.

Fishery and escapement age, sex, and size composition statistics were estimated from samples collected. Minimum sample sizes necessary to stratify age and sex composition through time were calculated. The number of samples required by species were those necessary to attain a level of 10% precision and 5% accuracy based on the number of predominant age classes typically present. In 1982, only chum salmon samples from District 1 were taken in large enough numbers to allow discrimination into two sample periods. The age, size, and sex characteristics of the subsistence harvests in all districts, and the District 2 commercial harvest, was estimated by directly apportioning the nearest district commercial catch samples. This was possible because the gear used to harvest salmon for subsistence purposes was largely the same as that used for commercial fishing.

RESULTS AND DISCUSSION

Harvest Data

A total of 141,163 chinook, 521,189 chum, 97,716 sockeye, 18,264 pink, and 615,233 coho salmon were caught during commercial and subsistence salmon fishing activities in the Kuskokwim area in 1982 (Table 1). Total chinook salmon harvest was the second largest ever documented, while the small (chum, sockeye, and pink) salmon harvest was only slightly above average. Commercial harvests accounted for 79,821 chinook, 325,473 chum, 97,716 sockeye, 18,264 pink, and 570,052 coho salmon. These values represent record catches of chinook and coho salmon, and a near record catch of sockeye salmon. Chum and pink salmon catches were average. The largest chinook, chum, and coho salmon commercial catches were reported from District 1 (Table 2). Fisheries in District 2 harvested relatively low numbers of all species, chum and coho salmon were predominant in the catches (Table 3). District 4 produced the bulk of commercially harvested pink salmon (Table 4), and peak sockeye catches occurred in District 5 (Table 5). Reported subsistence harvests of all species groups were close to historic average catch values.

Age, Sex, and Length Composition for the Kuskokwim Area

Composite average age and sex composition estimates for all salmon harvested both in the Kuskokwim River and in Kuskokwim Bay (excluding those taken in Mekoryuk) were calculated. Most of the 141,162 chinook salmon were age 6_2 (53%) and 5_2 (33%), and just over half (57%) were males (Table 6). Most of the 520,449 chum salmon caught (Table 7) were age 4_1 (62%) or 5_1 (35%) and the 615,223 coho salmon caught in the area were typically age 4_3 (Table 8). Without exception, the Kuskokwim area coho salmon sampled were 1-ocean fish.

Kuskokwim River

Age, size, and sex statistics for Kuskokwim River salmon commercial and subsistence harvests and escapement were calculated and are presented by category.

District (W-1) Commercial Harvest:

The majority of the record 45,449 chinook salmon commercially landed in District 1 in 1982 were age 6_2 (62%), of which most were females (Table 9). Males comprised 59% of the total catch; most of the male catch was split between ages 5_2 (21%) and 6_2 (26%). The majority of the 259,254 harvested chum salmon were age 4_1 (63%) and age 5_1 (34%) (Table 10). Males predominated the catch and age composition of the two sexes were similar. Younger, age 4_1 fish (79%), and females were more prevalent during the latter half of the chum salmon harvest. The largely incidental catch of 31,233 sockeye salmon was the second largest recorded, consisted primarily of age 5_2 fish (65%), and was split evenly between sexes (Table 11). The 1982 record harvest of 435,357 coho salmon in District 1 was 94% age 4_3, and evenly split between males and females (Table 12).

District (W-2) Commercial Harvest:

No sampling was conducted upon the limited catches in the Middle Kuskokwim District (W-2). Therefore, the age, length, and sex compositions of the 2,785 chinook (Table 13), 1,921 sockeye (Table 14), 11,760 coho (Table 15), 7 pink, and 19,052

Table 1. Total harvest of Kuskokwim area salmon by district and species, 1982.

COMMERCIAL CATCH:

District	Chinook	Chum	Sockeye	Pink	Coho
Lower Kuskokwim (W-1)	45,449	259,254	31,233	1,741	435,357
Middle Kuskokwim (W-2)	2,785	19,052	1,921	7	11,760
Quinhagak (W-4)	22,106	33,336	25,685	11,835	73,651
Goodnews Bay (W-5)	9,481	13,831	38,877	4,681	49,284
Subtotal	79,821	325,473	97,716	18,264	570,052

SUBSISTENCE CATCH:

Area	Families[1]	Chinook	Chum	Sockeye	Pink	Coho
Kuskokwim R.[2]	976	57,703	190,036	---	---	41,619
Quinhagak Area	67	2,402	2,186	---	---	860
Goodnews Bay	48	1,236	2,754	---	---	2,692
Subtotal	1,091	61,341	194,976	---	---	45,171
Kuskokwim River and Kuskokwim Bay Total		141,162	520,449	97,716	18,264	615,223
Mekoryuk[3]		1	740	---	---	10
Kuskokwim Area Total		141,163	521,189	97,716	18,264	615,233

[1] Estimated total number of fishing families.

[2] Includes McGrath and Nikolai.

[3] Subsistence harvest only (Nunivak Island).

Table 2. Lower Kuskokwim District (W-1) commercial catch of salmon by species and date, 1982.

Date[1]	Hrs.	Fishermen[2]	CATCH				
			Chinook	Chum	Sockeye	Pink	Coho
6/14	6	464	4,912	2,532	321	0	0
6/17	6	496	11,285	4,694	1,061	6	0
6/21	6	499	13,343	10,003	2,432	15	0
6/24	4	459	8,548	12,908	3,157	1	0
6/28	4	352	1,943	58,528	9,938	20	0
6/30	4	483	2,064	47,773	5,824	19	0
7/02	4	434	1,095	38,918	3,110	38	0
7/05	6	372	875	29,315	2,769	88	0
7/08	6	435	748	28,942	1,786	221	2
7/12	6	354	307	20,709	638	472	23
7/29	6	416	114	2,599	48	377	19,561
8/02	6	388	67	949	69	156	31,944
8/05	6	445	47	624	26	180	35,766
8/09	6	442	29	342	25	73	61,231
8/12	6	449	26	189	6	34	80,685
8/16	6	420	15	96	5	8	77,785
8/19	6	403	12	69	12	10	49,566
8/23	6	349	3	28	5	13	25,218
8/26	6	314	9	18	0	3	26,761
8/30	6	302	7	18	1	7	26,815
TOTAL	112	686	45,449	259,254	31,233	1,741	435,357

[1] Starting date of each commercial opening.

[2] Number of fishermen making at least one delivery.

Table 3. Middle Kuskokwim District (W-2) commercial catch of salmon by species and date, 1982.

			CATCH				
Date [1]	Hrs.	Fishermen [2]	Chinook	Chum	Sockeye	Pink	Coho
6/17	6	10	222	274	19	0	0
6/21	6	23	769	817	53	0	0
6/24	6	35	1,122	1,912	434	0	0
7/02	6	24	271	7,060	607	0	0
7/05	6	47	398	8,811	808	7	0
8/09	6	15	2	144	0	0	1,841
8/16	6	13	0	29	0	0	4,567
8/19	6	21	1	5	0	0	5,352
TOTAL	48	60	2,785	19,052	1,921	7	11,760

[1] Starting date of each commercial opening.

[2] Number of fishermen making at least one delivery.

Table 4. Quinhagak District (W-4) commercial catch of salmon by species and date, 1982.

			CATCH				
Date [1]	Hrs.	Fishermen [2]	Chinook	Chum	Sockeye	Pink	Coho
6/17	12	72	3,527	1,556	1,119	0	0
6/21	12	70	4,268	2,278	2,141	0	0
6/24	12	83	5,406	1,403	1,595	0	0
6/28	12	58	1,438	2,458	1,908	3	0
7/02	12	52	1,204	1,972	2,177	0	0
7/05	12	50	913	1,820	2,934	0	0
7/07	12	107	1,566	4,016	4,118	826	0
7/09	12	97	890	3,830	3,048	761	0
7/12	12	73	687	3,742	1,061	1,207	2
7/14	12	66	680	2,084	1,426	775	2
7/16	12	63	533	2,193	1,293	304	13
7/19	12	83	390	2,339	866	1,867	88
7/21	12	74	203	1,827	722	1,824	366
7/23	12	57	88	1,791	328	1,533	375
7/26	12	0	0	0	0	0	0
7/28	12	48	56	333	102	685	1,214
7/30	12	50	104	232	112	593	2,563
8/02	12	71	53	153	38	628	2,806
8/05	12	85	27	134	69	401	2,987
8/06	12	71	26	112	39	218	4,199
8/09	12	64	6	11	6	68	5,676
8/11	12	91	15	37	25	103	10,076
8/13	12	21	0	2	0	4	1,561
8/16	12	5	1	2	0	2	1,403
8/18	12	84	9	9	6	21	9,776
8/20	12	69	6	3	9	19	3,958
8/23	12	47	1	3	2	2	5,873
8/25	12	65	6	4	1	8	5,308
8/27	12	57	3	2	0	6	5,975
8/30	12	53	0	0	0	0	9,431
TOTAL	360	177	22,106	33,336	25,685	11,838	73,651

[1] Starting date of each commercial opening.

[2] Number of fishermen making at least one delivery.

Table 5. Goodnews District (W-5) commercial catch of salmon by species and date, 1982.

			CATCH				
Date [1]	Hrs.	Fishermen [2]	Chinook	Chum	Sockeye	Pink	Coho
6/17	12	18	362	167	744	0	0
6/21	12	29	1,535	698	1,820	0	0
6/24	12	30	620	594	2,120	0	0
6/28	12	29	959	649	3,371	0	0
6/30	60	34	1,551	1,627	8,143	0	0
7/05	24	30	1,809	1,976	4,221	0	0
7/07	24	32	738	1,890	4,833	0	0
7/09	24	38	351	1,191	3,751	488	0
7/12	24	35	737	1,384	2,318	582	0
7/14	24	31	514	2,123	2,481	960	0
7/16	24	19	66	476	1,281	497	0
7/19	24	37	66	506	1,683	958	6
7/21	12	26	68	233	507	406	7
7/23	12	9	17	35	162	158	13
7/26	12	0	0	0	0	0	0
7/28	12	21	5	93	278	190	153
7/30	12	17	19	42	344	94	237
8/02	12	30	19	47	335	153	1,148
8/04	12	24	12	29	188	111	949
8/06	12	28	6	31	251	42	1,713
8/09	12	26	11	19	46	14	2,240
8/11	12	32	5	13	0	16	6,065
8/13	12	21	5	4	0	12	4,162
8/16	12	29	0	0	0	0	5,456
8/18	12	20	0	0	0	0	1,446
8/20	12	1	1	0	0	0	68
8/23	12	25	0	0	0	0	5,306
8/25	12	28	0	0	0	0	3,158
8/27	12	38	3	0	0	0	6,625
8/30	12	33	2	0	0	0	3,730
9/01	12	31	0	0	0	0	2,778
9/03	12	26	0	0	0	0	2,309
9/06	12	28	0	0	0	0	1,715
9/08	12	0	0	0	0	0	0
TOTAL	540	48	9,481	13,831	38,877	4,681	49,284

[1] Starting date of each commercial opening.

[2] Number of fishermen making at least one delivery.

Table 6. Total harvest of Kuskokwim area chinook salmon by age and sex, 1982[1].

	AGE GROUP							
	32	42	52	62	63	72	73	TOTAL
MALES								
NUMBER	296	12,881	34,402	31,506	534	375	149	80,143
PERCENT	0.21	9.13	24.37	22.31	0.38	0.26	0.11	56.77
FEMALES								
NUMBER	0	767	12,892	43,851	308	3,201	0	61,019
PERCENT	0.00	0.54	9.13	31.07	0.22	2.27	0.00	43.23
SEXES COMBINED								
NUMBER	296	13,648	47,294	75,357	842	3,576	149	141,162
PERCENT	0.21	9.67	33.50	53.38	0.60	2.53	0.11	100.00

[1] Combined commercial and subsistence harvest from all districts, including Kuskokwim Bay.

Table 7. Total harvest of Kuskokwim area chum salmon by age and sex, 1982[1].

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	3,988	153,727	747	112,064	1,161	4,407	276,094
PERCENT	0.77	29.54	0.14	21.53	0.22	0.85	53.05
FEMALES							
NUMBER	1,763	169,206	0	68,777	2,150	2,459	244,355
PERCENT	0.34	32.52	0.00	13.21	0.41	0.47	46.95
SEXES COMBINED							
NUMBER	5,751	322,933	747	180,841	3,311	6,866	520,449
PERCENT	1.11	62.06	0.14	34.74	0.63	1.32	100.00

[1] Includes small numbers of sockeye and pink salmon.

Table 8. Total harvest of Kuskokwim area coho salmon by age and sex, 1982.

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	11,783	288,615	6,083	306,481
PERCENT	1.91	46.91	0.99	49.81
FEMALES				
NUMBER	7,619	294,656	6,467	308,742
PERCENT	1.24	47.89	1.06	50.19
SEXES COMBINED				
NUMBER	19,402	583,271	12,550	615,223
PERCENT	3.15	94.80	2.05	100.00

Table 9. Lower Kuskokwim District (W-1) commercial catch of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP							
	32	42	52	62	63	72	73	TOTAL
MALES								
NUMBER	127	4,895	9,535	12,013	127	127	64	26,888
PERCENT	0.30	10.80	21.00	26.40	0.30	0.30	0.10	59.20
AV LENGTH	376.00	535.58	711.85	840.04	733.00	964.50	685.00	736.68
STD ERROR	4.00	4.26	5.31	6.46	1.00	76.50	0.00	5.93
SAMP SIZE	2	77	150	189	2	2	1	423
FEMALES								
NUMBER	0	64	890	16,272	64	1,271	0	18,561
PERCENT	0.00	0.10	2.00	35.80	0.10	2.80	0.00	40.80
AV LENGTH	0.00	816.00	819.64	866.88	826.00	945.25	0.00	869.66
STD ERROR	0.00	0.00	15.04	3.27	0.00	11.93	0.00	4.41
SAMP SIZE	0	1	14	256	1	20	0	292
SEXES COMBINED								
NUMBER	127	4,959	10,425	28,285	191	1,398	64	45,449
PERCENT	0.30	10.90	23.00	62.20	0.40	3.10	0.10	100.00
AV LENGTH	376.00	539.20	721.05	855.48	764.16	947.00	685.00	790.99
STD ERROR	4.00	4.21	6.14	4.63	.66	17.80	0.00	5.31
SAMP SIZE	2	78	164	445	3	22	1	715

Table 10. Lower Kuskokwim District (W-1) commercial catch of chum salmon, age and length (mm) by sex, 1982.

PERIOD 1 (6/15/82-7/02/82)

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	1,654	51,696	414	50,456	414	2,068	106,702
PERCENT	0.90	29.50	0.20	28.80	0.20	1.20	60.80
AV LENGTH	562.00	599.80	682.00	629.69	566.00	668.40	614.87
STD ERROR	4.12	2.75	0.00	3.25	0.00	16.77	3.28
SAMP SIZE	4	125	1	122	1	5	258
FEMALES							
NUMBER	0	44,667	0	22,333	827	827	68,654
PERCENT	0.00	25.50	0.00	12.70	0.50	0.50	39.20
AV LENGTH	0.00	566.20	0.00	574.89	578.00	578.00	569.31
STD ERROR	0.00	2.26	0.00	3.43	34.00	32.00	3.38
SAMP SIZE	0	108	0	54	2	2	166
SEXES COMBINED							
NUMBER	1,654	96,363	414	72,789	1,241	2,895	175,356
PERCENT	0.90	55.00	0.20	41.50	0.70	1.70	100.00
AV LENGTH	562.00	584.23	682.00	612.88	574.00	642.57	597.03
STD ERROR	4.12	2.52	0.00	3.31	34.00	21.12	3.32
SAMP SIZE	4	233	1	176	3	7	424

-Continued-

Table 10. Lower Kuskokwim District (W-1) commercial catch of chum salmon, age and length (mm) by sex, 1982 (continued).

PERIOD 2 (7/03/82-8/09/82)

	AGE GROUP					
	31	41	51	52	61	TOTAL
MALES						
NUMBER	363	27,058	7,082	182	182	34,867
PERCENT	0.40	32.40	8.40	0.20	0.20	41.60
AV LENGTH	534.50	586.11	598.36	624.00	588.00	588.27
STD ERROR	17.50	2.08	4.48	0.00	0.00	2.74
SAMP SIZE	2	149	39	1	1	192
FEMALES						
NUMBER	908	38,680	8,898	363	182	49,031
PERCENT	1.10	46.10	10.60	0.40	0.20	58.40
AV LENGTH	547.20	561.92	570.49	542.00	547.00	563.00
STD ERROR	4.98	1.51	3.59	2.00	0.00	1.95
SAMP SIZE	5	213	49	2	1	270
SEXES COMBINED						
NUMBER	1,271	65,738	15,980	545	364	83,898
PERCENT	1.50	78.50	19.00	0.60	0.40	100.00
AV LENGTH	543.57	571.88	582.84	569.33	567.50	573.50
STD ERROR	8.56	1.74	3.98	2.00	0.00	2.28
SAMP SIZE	7	362	88	3	2	462

-Continued-

Table 10. Lower Kuskokwim District (W-1) commercial catch of chum salmon, age and length (mm) by sex, 1982 (continued).

PERIODS COMBINED

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	2,017	78,754	414	57,538	596	2,250	141,569
PERCENT	0.80	30.40	0.15	22.20	0.20	0.85	54.60
AV LENGTH	557.05	595.10	682.00	625.83	583.71	661.90	608.31
STD ERROR	8.58	2.39	0.00	3.55	0.00	13.97	3.02
SAMP SIZE	6	274	1	161	2	6	450
FEMALES							
NUMBER	908	83,347	0	31,231	1,190	1,009	117,685
PERCENT	0.35	32.15	0.00	12.05	0.45	0.40	45.40
AV LENGTH	547.20	564.21	0.00	573.64	567.02	572.41	566.68
STD ERROR	4.98	1.76	0.00	3.50	18.00	21.33	2.49
SAMP SIZE	5	321	0	103	4	3	436
SEXES COMBINED							
NUMBER	2,925	162,101	414	88,769	1,786	3,259	259,254
PERCENT	1.15	62.55	0.15	34.25	0.65	1.25	100.00
AV LENGTH	553.99	579.22	682.00	607.47	572.59	634.19	589.42
STD ERROR	6.95	2.05	0.00	3.53	12.00	16.42	2.76
SAMP SIZE	11	595	1	264	6	9	886

Table 11. Lower Kuskokwim District (W-1) commercial catch of sockeye salmon, age and length (mm) by sex, 1982.

	AGE GROUP					
	42	52	53	62	63	TOTAL
MALES						
NUMBER	1,538	10,056	592	118	4,141	16,445
PERCENT	4.90	32.20	1.90	0.40	13.30	52.70
AV LENGTH	519.08	604.69	553.60	620.00	603.74	594.71
STD ERROR	9.58	2.40	18.84	0.00	5.54	4.43
SAMP SIZE	13	85	5	1	35	139
FEMALES						
NUMBER	946	10,174	1,065	355	2,248	14,788
PERCENT	3.00	32.60	3.40	1.10	7.20	47.30
AV LENGTH	516.12	564.64	539.11	605.00	568.47	561.25
STD ERROR	5.76	2.21	6.92	12.58	4.85	3.43
SAMP SIZE	8	86	9	3	19	125
SEXES COMBINED						
NUMBER	2,484	20,230	1,657	473	6,389	31,233
PERCENT	7.90	64.80	5.30	1.50	20.50	100.00
AV LENGTH	517.95	584.55	544.29	608.74	591.33	578.87
STD ERROR	8.13	2.30	11.18	9.44	5.30	3.96
SAMP SIZE	21	171	14	4	54	264

Table 12. Lower Kuskokwim District (W-1) commercial catch of coho salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	10,154	205,621	5,077	220,852
PERCENT	3.20	47.20	1.20	50.70
AV LENGTH	558.75	573.41	575.75	572.79
STD ERROR	13.36	2.65	25.12	3.66
SAMP SIZE	8	162	4	174
FEMALES				
NUMBER	5,077	204,351	5,077	214,505
PERCENT	1.20	46.90	1.20	49.30
AV LENGTH	545.00	575.24	577.50	574.58
STD ERROR	5.78	1.94	10.31	2.23
SAMP SIZE	4	161	4	169
SEXES COMBINED				
NUMBER	15,231	409,972	10,154	435,357
PERCENT	3.50	94.10	2.40	100.00
AV LENGTH	554.17	574.32	576.62	573.67
STD ERROR	10.83	2.30	17.72	2.95
SAMP SIZE	12	323	8	343

Table 13. Middle Kuskokwim District (W-2) commercial catch of chinook salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP							
	32	42	52	62	63	72	73	TOTAL
MALES								
NUMBER	8	300	584	736	8	8	4	1,648
PERCENT	0.30	10.80	21.00	26.40	0.30	0.30	0.10	59.20
AV LENGTH	376.00	535.58	711.85	840.04	733.00	964.50	685.00	736.65
FEMALES								
NUMBER	0	4	55	996	4	78	0	1,137
PERCENT	0.00	0.10	2.00	35.80	0.10	2.80	0.00	40.80
AV LENGTH	0.00	816.00	819.64	866.88	826.00	945.25	0.00	869.65
SEXES COMBINED								
NUMBER	8	304	639	1,732	12	86	4	2,785
PERCENT	0.30	10.90	23.00	62.20	0.40	3.10	0.10	100.00
AV LENGTH	376.00	539.27	721.13	855.47	764.00	947.04	685.00	790.95

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

Table 14. Middle Kuskokwim District (W-2) commercial catch of sockeye salmon, age and length (mm) by sex, 1982.

	AGE GROUP					
	42	52	53	62	63	TOTAL
MALES						
NUMBER	95	618	36	7	255	1,011
PERCENT	4.90	32.20	1.90	0.40	13.30	52.70
AV LENGTH	519.08	604.69	553.60	620.00	603.74	594.69
FEMALES						
NUMBER	58	627	65	22	138	910
PERCENT	3.00	32.60	3.40	1.10	7.20	47.30
AV LENGTH	516.12	564.64	539.11	605.00	568.47	561.28
SEXES COMBINED						
NUMBER	153	1,245	101	29	393	1,921
PERCENT	7.90	64.80	5.30	1.50	20.50	100.00
AV LENGTH	517.96	584.52	544.27	608.62	591.36	578.86

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

Table 15. Middle Kuskokwim District (W-2) commercial catch of coho salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	274	5,555	137	5,966
PERCENT	3.20	47.20	1.20	50.70
AV LENGTH	558.75	573.41	575.75	572.79
FEMALES				
NUMBER	137	5,520	137	5,794
PERCENT	1.20	46.90	1.20	49.30
AV LENGTH	545.00	575.24	577.50	574.58
SEXES COMBINED				
NUMBER	411	11,075	274	11,760
PERCENT	3.50	94.10	2.40	100.00
AV LENGTH	554.17	574.32	576.62	573.67

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

chum salmon (Table 16) were apportioned directly from composition estimates calculated for District 1 commercial catches. While some general sifting of larger fish probably occurred through fishing activities in the Kuskokwim River below District 2, the methods employed and gill net mesh sizes used are similar throughout the area, so apportioned composition data should closely approximate the actual composition of the catches.

Subsistence:

Subsistence catches along the Kuskokwim River were not sampled; the age, length, and sex information presented is taken directly from the District 1 commercial catch samples. This procedure is again justified because the gear used for the subsistence salmon harvest along the Kuskokwim River was similar or identical to that used for commercial salmon fishing. Estimated catches of 57,705 chinook (Table 17), 190,036 chum (Table 18), and 41,619 coho salmon (Table 19), are considerable when compared to Kuskokwim River commercial catches. The estimated 1982 chinook salmon subsistence harvest was larger than the commercial harvest (48,234 chinook salmon in Districts 1 and 2).

Total Harvest:

In all, some 105,937 chinook (Table 20), 468,342 chum (Table 21), 33,154 sockeye, 1,748 pink, and 488,736 coho (Table 22) salmon were caught in Kuskokwim River commercial and subsistence fisheries in 1982. The bulk of the coho catch was taken commercially. It should be noted that the subsistence portion of the chum salmon total harvest includes small numbers of sockeye, pink, and immature male chinook salmon, lumped together as "small salmon" in the reporting procedure.

Escapement:

Peak spawning abundance aerial survey index counts were conducted on as many major spawning concentrations as time, budget constraints, and weather permitted. Major concentrations of chinook salmon were observed in the Aniak and Holitna Rivers where 2,086 and 1,123 were recorded respectively (Table 23). Smaller, but significant numbers were observed in the Eek, Chukowan, and South fork of the Salmon Rivers (326, 236, and 284 fish, respectively). Chum salmon were observed in large numbers in the Aniak, Holitna, and Oskawalik Rivers (31,990, 13,188, and 2,079, respectively). Significant numbers of sockeye salmon were observed only in the Chukowan and Holitna Rivers (1,372 and 1,235 fish, respectively). Few pink or coho salmon were observed in any Kuskokwim River tributaries due largely to the time of year that the surveys were conducted. Although the index counts are a measure of relative abundance, most counts occurred at times of less than peak abundance for most of the species. Therefore, comparisons of counts between years should be viewed with caution.

Escapement indices of migrating salmon in the Aniak River were tabulated daily in 1982 and peak escapement occurred on 9 July (Table 24). These side-scanning sonar counts were not apportioned into daily species counts, although chinook and chum salmon were caught in 4.25-inch (11 cm), 5.5-inch (14 cm), 7.5-inch (19 cm), and 8.5-inch (22 cm) stretch mesh gill nets fished daily (see Tables 25 to 32). Total estimated counts for the season were apportioned by species based upon the weighted average of fish caught in the gill nets without adjustments for size-dependent catchability. Of the 33,864 chinook salmon estimated to have passed the

Table 16. Middle Kuskokwim District (W-2) commercial catch of chum salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	149	5,789	30	4,228	43	165	10,404
PERCENT	0.80	30.40	0.15	22.20	0.20	0.85	54.60
AV LENGTH	557.05	595.10	682.00	625.83	583.71	661.90	608.31
FEMALES							
NUMBER	67	6,124	0	2,295	88	74	8,648
PERCENT	0.35	32.15	0.00	12.05	0.45	0.40	45.40
AV LENGTH	547.20	564.21	0.00	573.64	567.02	572.41	572.68
SEXES COMBINED							
NUMBER	216	11,913	30	6,523	131	239	19,052
PERCENT	1.15	62.55	0.15	34.25	0.65	1.25	100.00
AV LENGTH	553.99	579.22	682.00	607.47	572.59	634.19	589.42

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

Table 17. Kuskokwim River subsistence catch of chinook salmon, age and length (mm) by sex, 1982[1] [2].

	AGE GROUP							
	32	42	52	62	63	72	73	TOTAL
MALES								
NUMBER	161	6,214	12,106	15,254	161	161	81	34,138
PERCENT	0.30	10.80	21.00	26.40	0.30	0.30	0.10	59.20
AV LENGTH	376.00	535.58	711.85	840.04	733.00	964.50	685.00	736.69
FEMALES								
NUMBER	0	81	1,130	20,659	81	1,614	0	23,565
PERCENT	0.00	0.10	2.00	35.80	0.10	2.80	0.00	40.80
AV LENGTH	0.00	816.00	819.64	866.88	826.00	945.25	0.00	869.67
SEXES COMBINED								
NUMBER	161	6,295	13,236	35,913	242	1,775	81	57,703
PERCENT	0.30	10.90	23.00	62.20	0.40	3.10	0.10	100.00
AV LENGTH	376.00	539.19	721.05	855.48	764.13	947.00	685.00	790.99

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

[2] Includes subsistence catches from McGrath and Nikolai.

Table 18. Kuskokwim River subsistence catch of chum salmon, age and length (mm) by sex, 1982[1] [2] [3].

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	1,479	57,729	303	42,177	436	1,649	103,773
PERCENT	0.80	30.40	0.15	22.20	0.20	0.85	54.60
AV LENGTH	557.05	595.10	682.00	625.83	583.71	661.90	608.31
FEMALES							
NUMBER	666	61,093	0	22,893	872	739	86,263
PERCENT	0.35	32.15	0.00	12.05	0.45	0.40	45.40
AV LENGTH	547.20	564.21	0.00	573.64	567.02	572.41	566.68
SEXES COMBINED							
NUMBER	2,145	118,822	303	65,070	1,308	2,388	190,036
PERCENT	1.15	62.55	0.15	34.25	0.65	1.25	100.00
AV LENGTH	553.99	579.22	682.00	607.47	572.59	634.19	589.42

[1] Allocations by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

[2] Includes subsistence catches from McGrath and Nikolai.

[3] Includes small numbers of sockeye and pink salmon.

Table 19. Kuskokwim River subsistence catch of coho salmon, age and length (mm) by sex, 1982[1] [2].

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	971	19,657	485	21,113
PERCENT	3.20	47.20	1.20	50.70
AV LENGTH	558.75	573.41	575.75	572.79
FEMALES				
NUMBER	485	19,536	485	20,506
PERCENT	1.20	46.90	1.20	49.30
AV LENGTH	545.00	575.24	577.50	574.58
SEXES COMBINED				
NUMBER	1,456	39,193	970	41,619
PERCENT	3.50	94.10	2.40	100.00
AV LENGTH	554.17	574.32	576.62	573.67

[1] Allocation by sex and age class based on 1982 Kuskokwim District (W-1) commercial catch samples.

[2] Includes subsistence catches from McGrath and Nikolai.

Table 20. Kuskokwim River total harvest of chinook salmon by age and sex, 1982.

	AGE GROUP							
	32	42	52	62	63	72	73	TOTAL
MALES								
NUMBER	296	11,409	22,225	28,003	296	296	149	62,674
PERCENT	0.30	10.80	21.00	26.40	0.30	0.30	0.10	59.20
FEMALES								
NUMBER	0	149	2,075	37,927	149	2,963	0	43,263
PERCENT	0.00	0.10	2.00	35.80	0.10	2.80	0.00	40.80
SEXES COMBINED								
NUMBER	296	11,558	24,300	65,930	445	3,259	149	105,937
PERCENT	0.30	10.90	23.00	62.20	0.40	3.10	0.10	100.00

Table 21. Kuskokwim River total harvest of chum salmon by age and sex, 1982[1].

	AGE GROUP						
	31	41	42	51	52	61	TOTAL
MALES							
NUMBER	3,645	142,272	747	103,943	1,075	4,064	255,746
PERCENT	0.65	30.95	0.10	18.60	0.20	0.60	51.20
FEMALES							
NUMBER	1,641	150,564	0	56,419	2,150	1,822	212,596
PERCENT	0.55	35.80	0.00	11.65	0.45	0.35	48.80
SEXES COMBINED							
NUMBER	5,286	292,836	747	160,362	3,225	5,886	468,342
PERCENT	1.20	66.75	0.10	30.25	0.65	1.05	100.00

[1] Includes small numbers of sockeye and pink salmon.

Table 22. Kuskokwim River total harvest of coho salmon by age and sex, 1982.

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	11,399	230,833	5,699	247,931
PERCENT	3.20	47.20	1.20	50.70
FEMALES				
NUMBER	5,699	229,407	5,699	240,805
PERCENT	1.20	46.90	1.20	49.30
SEXES COMBINED				
NUMBER	17,098	460,240	11,398	488,736
PERCENT	3.50	94.10	2.40	100.00

Table 23. Aerial survey indices of peak salmon abundance on spawning grounds of selected Kuskokwim area streams by species, 1982[1].

Location	Date Surveyed	Chinook	Chum	Sockeye	Pink	Coho
KUSKOKWIM RIVER:						
Aniak R.	8/04/82	2,086	31,990	20	270	---
Baird Ck.[2]	7/28/82	127	---	---	---	---
Chimeekluk Ck.	7/28/82	4	---	---	---	---
Chukowan R.	8/05/83	236	180	1,372	15	6
Eek R.	8/06/82	326	74	175	---	---
Mdl. Fk. Eek R.[3]	8/04/82	34	---	---	---	---
Holitna R.[4]	8/05/82	1,123	13,188	1,235	---	---
Holokuk R.	8/05/82	42	635	---	---	---
Kisaralik R.	8/04/82	81	---	---	---	---
Kwethluk R.	8/04/82	18	---	30	---	---
Oskawalik R.	8/05/82	100	2,079	---	---	---
Salmon R.[5]	8/04/82	126	175	45	---	---
N. Fk. Salmon R.[2]	7/28/82	69	---	---	---	---
Mdl. Fk. Salmon R.[2]	7/28/82	66	---	---	---	---
S. Fk. Salmon R.[2]	7/28/82	284	---	---	---	---
KUSKOKWIM BAY:						
Goodnews R.	8/05/82	1,990	9,700	19,160	2,100	---
Mdl. Fk. Goodnews R.	8/05/82	1,546	6,300	2,327	3,325	275
Kanektok R.	8/06/82	8,142	8,820	41,400	67,621	9,700
Kagati L.	8/06/82	---	---	14,550	---	---

[1] All surveys were good to fair unless otherwise noted.

[2] Pitka River system.

[3] Poor survey conditions

[4] Below Ignatti weir on the Kogrukluk River.

[5] Aniak River system.

Table 24. Aniak River daily adjusted sonar counts, 1982.

Date	Adjusted Counts	Date	Adjusted Counts
6/21	1,624	7/12	9,660
6/22	1,056	7/13	7,908
6/23	221	7/14	14,881
6/24	374	7/15	9,514
6/25	1,658	7/16	6,333
6/26	4,983	7/17	8,065
6/27	3,522	7/18	8,999
6/28	4,071	7/19	5,286
6/29	3,689	7/20	4,767
6/30	5,432	7/21	3,030
7/01	8,630	7/22	4,479
7/02	12,818	7/23	2,394
7/03	11,590	7/24	2,650
7/04	12,770	7/25	2,560
7/05	9,133	7/26	3,587
7/06	9,139	7/27	3,034
7/07	7,903	7/28	2,415
7/08	10,373	7/29	2,822
7/09	19,970	7/30	2,945
7/10	9,520	7/31	3,085
7/11	9,940	8/01	2,009
		Total	259,039

Table 25. Aniak sonar 4.25-inch (11 cm) mesh gill net samples of chinook salmon age and length (mm) by sex, 1982.

	AGE GROUP	
	42	TOTAL
MALES		
PERCENT	100.00	100.00
AV LENGTH	506.00	506.00
STD ERROR	0.00	0.00
SAMP SIZE	1	1
FEMALES		
PERCENT	0.00	0.00
AV LENGTH	0.00	0.00
STD ERROR	0.00	0.00
SAMP SIZE	0	0
SEXES COMBINED		
PERCENT	100.00	100.00
AV LENGTH	506.00	506.00
STD ERROR	0.00	0.00
SAMP SIZE	1	1

Table 26. Aniak sonar 4.25-inch (11 cm) mesh gill net samples of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	41	51	61	TOTAL
MALES				
PERCENT	53.30	13.30	6.70	73.30
AV LENGTH	610.50	572.00	650.00	607.12
STD ERROR	10.69	20.00	0.00	11.41
SAMP SIZE	8	2	1	11
FEMALES				
PERCENT	26.70	0.00	0.00	26.70
AV LENGTH	574.00	0.00	0.00	574.00
STD ERROR	16.27	0.00	0.00	16.27
SAMP SIZE	4	0	0	4
SEXES COMBINED				
PERCENT	80.00	13.30	6.70	100.00
AV LENGTH	598.32	572.00	650.00	598.28
STD ERROR	12.55	20.00	0.00	12.71
SAMP SIZE	12	2	1	15

Table 27. Aniak sonar 5.5-inch (14 cm) mesh gill net samples of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	42	52	62	TOTAL
MALES				
PERCENT	45.00	5.00	20.00	70.00
AV LENGTH	531.78	622.00	741.50	598.14
STD ERROR	21.63	0.00	55.76	29.84
SAMP SIZE	9	1	4	14
FEMALES				
PERCENT	0.00	15.00	15.00	30.00
AV LENGTH	0.00	718.67	857.33	788.00
STD ERROR	0.00	17.30	24.48	20.89
SAMP SIZE	0	3	3	6
SEXES COMBINED				
PERCENT	45.00	20.00	35.00	100.00
AV LENGTH	531.78	694.50	791.14	655.10
STD ERROR	21.63	12.97	42.35	27.15
SAMP SIZE	9	4	7	20

Table 28. Aniak sonar 5.5-inch (14 cm) mesh gill net samples of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP		
	41	51	TOTAL
MALES			
PERCENT	27.00	14.70	41.70
AV LENGTH	592.23	621.87	602.68
STD ERROR	2.62	4.26	3.19
SAMP SIZE	83	45	128
FEMALES			
PERCENT	42.00	16.30	58.30
AV LENGTH	564.96	575.76	567.98
STD ERROR	2.00	3.11	2.31
SAMP SIZE	129	50	179
SEXES COMBINED			
PERCENT	69.00	31.00	100.00
AV LENGTH	575.63	597.63	582.45
STD ERROR	2.24	3.65	2.68
SAMP SIZE	212	95	307

Table 29. Aniak sonar 7.5-inch (19 cm) mesh gill net samples of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP				
	42	52	62	72	TOTAL
MALES					
PERCENT	27.40	9.10	4.50	4.50	45.50
AV LENGTH	531.00	664.00	690.00	1111.00	630.69
STD ERROR	18.54	78.00	0.00	0.00	26.73
SAMP SIZE	6	2	1	1	10
FEMALES					
PERCENT	0.00	4.50	45.50	4.50	54.50
AV LENGTH	0.00	826.00	878.30	914.00	876.93
STD ERROR	0.00	0.00	14.07	0.00	11.72
SAMP SIZE	0	1	10	1	12
SEXES COMBINED					
PERCENT	27.40	13.60	50.00	9.00	100.00
AV LENGTH	531.00	717.60	861.35	1012.50	764.89
STD ERROR	18.54	52.00	12.79	0.00	18.54
SAMP SIZE	6	3	11	2	22

Table 30. Aniak sonar 7.5-inch (19 cm) mesh gill net samples of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	41	51	61	TOTAL
MALES				
PERCENT	47.40	49.50	.50	97.40
AV LENGTH	605.60	615.87	639.00	610.99
STD ERROR	2.55	2.54	0.00	2.53
SAMP SIZE	90	94	1	185
FEMALES				
PERCENT	1.10	1.50	0.00	2.60
AV LENGTH	609.00	601.00	0.00	604.38
STD ERROR	33.00	8.50	0.00	18.30
SAMP SIZE	2	3	0	5
SEXES COMBINED				
PERCENT	48.50	51.00	.50	100.00
AV LENGTH	605.68	615.43	639.00	610.82
STD ERROR	3.21	2.73	0.00	2.95
SAMP SIZE	92	97	1	190

Table 31. Aniak sonar 8.5-inch (22 cm) mesh gill net samples of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP				
	42	52	62	72	TOTAL
MALES					
PERCENT	7.70	15.40	30.70	0.00	53.80
AV LENGTH	550.00	709.00	828.00	0.00	754.15
STD ERROR	0.00	17.00	34.01	0.00	24.29
SAMP SIZE	1	2	4	0	7
FEMALES					
PERCENT	0.00	0.00	30.80	15.40	46.20
AV LENGTH	0.00	0.00	893.50	954.00	913.67
STD ERROR	0.00	0.00	38.56	22.00	33.04
SAMP SIZE	0	0	4	2	6
SEXES COMBINED					
PERCENT	7.70	15.40	61.50	15.40	100.00
AV LENGTH	550.00	709.00	860.80	954.00	827.85
STD ERROR	0.00	17.00	36.28	22.00	28.33
SAMP SIZE	1	2	8	2	13

Table 32. Aniak sonar 8.5-inch (22 cm) mesh gill net samples of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	41	51	61	TOTAL
MALES				
PERCENT	39.60	45.30	3.80	88.70
AV LENGTH	609.81	624.12	668.00	619.61
STD ERROR	6.46	5.22	14.00	6.14
SAMP SIZE	21	24	2	47
FEMALES				
PERCENT	7.50	3.80	0.00	11.30
AV LENGTH	558.00	602.00	0.00	572.80
STD ERROR	8.40	18.00	0.00	11.60
SAMP SIZE	4	2	0	6
SEXES COMBINED				
PERCENT	47.10	49.10	3.80	100.00
AV LENGTH	601.56	622.41	668.00	614.32
STD ERROR	6.77	6.20	14.00	6.76
SAMP SIZE	25	26	2	53

sonar site, age 4_2 males were present in much greater relative magnitude (30%) (Table 33) than observed in the commercial harvests downriver. Males predominated in the chinook escapement. Some 389,226 chum salmon were estimated to have passed the sonar location, most of which were age 4_1 (60%) and male (66%) (Table 34).

Salmon migrating up the Kogrukluk River were counted and sampled daily at a weir on the lower reaches of this tributary to the Holitna River (Ignatti weir). In all, some 10,990 chinook, 51,204 chum, 20,649 sockeye, and 38,966 coho salmon were estimated to have passed beyond the weir (Table 35). Age 6_2 (58%) and age 5_2 (21%) fish comprised the major portion of the chinook salmon run (Table 36). The age structure of the Kogrukluk chinook escapement was similar to the age structure observed in the District 1 commercial harvest. The sex ratio was more even than that experienced in the commercial fishery. As in the commercial catch, the bulk of the chum salmon escapement was composed of age 4_1 fish (71%) and most were males (Table 37). The age composition of sockeye salmon sampled at the weir contrasted with commercial catch data however, and were predominantly age 5_3 (87%) (Table 38). Coho salmon sampled at the weir were all age 4_3 and most were males (Table 39).

A weir was operated on the Salmon River (Pitka Fork of the Middle Fork) in 1982. From 14 July until 30 July, some 511 chinook (Table 40) and 39 chum salmon were counted. Past aerial survey data parameters for the uncounted North Fork were applied to weir counts, resulting in a total escapement estimate of 612 chinook salmon in the entire Pitka Fork. Age 6_2 chinook were well represented (71%) while the age 5_2 component was very weak (16%) (Table 41). Chum salmon sampled at the weir (Table 42) were primarily age 4_1 (86%) in concert with chum salmon sampled throughout the Kuskokwim drainage in 1982.

Quinhagak Area

Age, sex, and size statistics for Quinhagak area salmon harvests and escapements were calculated and are presented by category.

District (W-4) Commercial Harvest:

In contrast to the sampling results in District 1, the 22,106 chinook salmon commercially harvested in District 4 were mostly age 5_2 (64%), and much of the remainder were age 6_2 (Table 43). Chum salmon catches totaled 33,336 fish and most were age 4_1 (63%) and 5_1 (33%) (Table 44). The 25,685 sockeye salmon taken in District 4 were nearly all one-freshwater age fish with 69% age 5_2 and 30% age 4_2 (Table 45). The 1982 catches in District 4 represent the second highest catches of chinook and sockeye salmon to date. The chum harvest, however, was well below average. The 73,651 coho salmon landed were predominantly age 4_3 (95%) (Table 46), and constitute a record harvest of that species in the district.

Subsistence:

Quinhagak area subsistence catches of 2,402 chinook (Table 47), 2,186 chum (Table 48), and 860 coho salmon (Table 49) were apportioned into average size by age and sex based on the commercial harvest samples for each species.

Table 33. Aniak River escapement of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP				
	42	52	62	72	TOTAL
MALES					
NUMBER	10,280	3,024	5,442	605	19,351
PERCENT	30.30	8.90	16.10	1.80	57.10
AV LENGTH	531.06	673.60	774.22	1111.00	639.85
STD ERROR	12.86	30.08	32.09	0.00	20.56
SAMP SIZE	17	5	9	1	32
FEMALES					
NUMBER	0	2,419	10,280	1,814	14,513
PERCENT	0.00	7.10	30.40	5.40	42.90
AV LENGTH	0.00	745.50	878.18	940.67	863.88
STD ERROR	0.00	29.49	12.35	18.42	15.97
SAMP SIZE	0	4	17	3	24
SEXES COMBINED					
NUMBER	10,280	5,443	15,722	2,419	33,864
PERCENT	30.30	16.00	46.50	7.20	100.00
AV LENGTH	531.06	705.55	842.20	983.27	735.86
STD ERROR	12.86	29.82	19.18	13.81	18.59
SAMP SIZE	17	9	26	4	56

Table 34. Aniak River escapement of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	41	51	61	TOTAL
MALES				
NUMBER	139,156	113,668	2,756	255,580
PERCENT	35.80	29.20	0.70	65.70
AV LENGTH	600.74	618.18	656.25	609.09
STD ERROR	1.81	2.06	9.15	2.00
SAMP SIZE	202	165	4	371
FEMALES				
NUMBER	95,757	37,889	0	133,646
PERCENT	24.60	9.70	0.00	34.30
AV LENGTH	565.65	578.09	0.00	569.18
STD ERROR	2.00	3.05	0.00	2.30
SAMP SIZE	139	55	0	194
SEXES COMBINED				
NUMBER	234,913	151,557	2,756	389,226
PERCENT	60.40	38.90	0.70	100.00
AV LENGTH	586.44	608.16	656.25	595.39
STD ERROR	1.89	2.31	9.15	2.10
SAMP SIZE	341	220	4	565

Table 35. Kogrukluk River (Ignatti weir) daily salmon escapement counts and estimated total escapements by species, 1982.

Date	Chinook	Chum	Sockeye	Coho
7/08	0	659	0	0
7/09	960	4,469	2,025	0
7/10	609	3,396	1,750	0
7/11	465	2,999	748	0
7/12	380	2,581	830	0
7/13	349	2,961	821	0
7/14	371	2,442	575	0
7/15	159	1,945	302	0
7/16	424	2,421	681	0
7/17	334	3,018	781	0
7/18	231	2,563	371	0
7/19	165	1,919	443	0
7/20	192	1,710	630	0
7/21	102	1,414	315	0
7/22	47	904	140	0
7/23	81	916	149	0
7/24	54	747	187	0
7/25	61	638	185	0
7/26	39	547	141	0
7/27	52	476	123	0
7/28	34	393	89	0
7/29	20	384	86	0
7/30	32	440	77	0
7/31	24	273	67	0
8/01	16	230	56	0
8/02	18	187	26	5
8/03	27	172	29	6
8/04	20	91	23	15
8/05	11	104	17	17
8/06	8	32	12	16
8/07	10	37	8	42
8/08	5	22	9	36
8/09	4	38	6	55
8/10	3	29	5	42
8/11	5	16	5	106
8/12	6	16	3	91
8/13	5	15	0	58
8/14	1	6	4	78
8/15	0	2	4	195
8/16	1	2	1	56
8/17	0	4	0	511
8/18	0	0	0	465
8/19	0	0	0	371
8/20	0	0	0	283
8/21	0	0	0	409
8/22	0	0	0	142
8/23	0	0	0	228
8/24	0	0	0	647
8/25	0	0	0	868
8/26	0	0	0	804
8/27	0	0	0	946
8/28	0	0	0	820
8/29	0	0	0	632
8/30	0	0	0	1,488
8/31	0	0	0	1,680
9/01	0	0	0	1,537
9/02	0	0	0	1,904
9/03	0	0	0	1,980
9/04	0	0	0	1,285
9/05	0	0	0	1,781
9/06	0	0	0	5,013
9/07	0	0	0	3,219
9/08	0	0	0	2,165
9/09	0	0	0	1,460
9/10	0	0	0	1,226
9/11	0	0	0	921
9/12	0	0	0	722
9/13	0	0	0	748
9/14	0	0	0	508
Totals	5,325	41,218	11,724	35,581
Est. Total Escapement[1]	10,990	51,204	20,649	38,966

[1] Weir operations began after a significant portion of the escapement had passed the weir site. This proportion was estimated based on subsequent escapement counts and historical migratory patterns. Actual counts were expanded to account for the missed proportion of the run.

Table 36. Kogrukluk River escapement of chinook salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP					
	32	42	52	62	72	TOTAL
MALES						
NUMBER	28	1,654	2,131	1,654	112	5,579
PERCENT	0.30	15.10	19.30	15.10	1.00	50.80
AV LENGTH	367.00	541.97	676.91	820.44	980.25	683.99
STD ERROR	0.00	5.81	7.25	10.62	9.68	7.83
SAMP SIZE	1	59	76	59	4	199
FEMALES						
NUMBER	0	0	196	4,710	505	5,411
	0.00	0.00	1.80	42.80	4.60	49.20
AV LENGTH	0.00	0.00	732.71	879.44	961.44	881.78
STD ERROR	0.00	0.00	33.63	4.33	12.20	6.13
SAMP SIZE	0	0	7	168	18	193
SEXES COMBINED						
NUMBER	28	1,654	2,327	6,364	617	10,990
PERCENT	0.30	15.10	21.10	57.90	5.60	100.00
AV LENGTH	367.00	541.97	681.61	864.11	964.85	781.37
STD ERROR	0.00	5.81	9.47	5.96	11.74	6.99
SAMP SIZE	1	59	83	227	22	392

[1] Lengths were collected and are reported as rear-orbit to fork of tail.

Table 37. Kogrukluk River escapement of chum salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP			
	41	51	61	TOTAL
MALES				
NUMBER	20,045	9,129	0	29,174
PERCENT	39.20	17.80	0.00	57.00
AV LENGTH	577.64	602.07	0.00	585.28
STD ERROR	2.28	3.30	0.00	2.60
SAMP SIZE	101	46	0	147
FEMALES				
NUMBER	16,275	5,557	198	22,030
PERCENT	31.70	10.90	0.40	43.00
AV LENGTH	562.46	579.64	645.00	567.54
STD ERROR	2.73	3.40	0.00	2.88
SAMP SIZE	82	28	1	111
SEXES COMBINED				
NUMBER	36,320	14,686	198	51,204
PERCENT	70.90	28.70	0.40	100.00
AV LENGTH	570.84	593.58	645.00	577.65
STD ERROR	2.48	3.34	0.00	2.72
SAMP SIZE	183	74	1	258

[1] Lengths were collected and are reported as rear-orbit to fork of tail.

Table 38. Kogrukluk River escapement of sockeye salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP				
	43	53	63	73	TOTAL
MALES					
NUMBER	93	12,092	744	0	12,929
PERCENT	0.50	58.50	3.60	0.00	62.60
AV LENGTH	380.00	583.53	596.37	0.00	582.80
STD ERROR	0.00	2.08	10.68	0.00	2.56
SAMP SIZE	1	130	8	0	139
FEMALES					
NUMBER	0	5,953	1,674	93	7,720
PERCENT	0.00	28.80	8.10	0.50	37.40
AV LENGTH	0.00	549.20	560.11	596.00	552.13
STD ERROR	0.00	2.77	4.54	0.00	3.12
SAMP SIZE	0	64	18	1	83
SEXES COMBINED					
NUMBER	93	18,045	2,418	93	20,649
PERCENT	0.50	87.30	11.70	0.50	100.00
AV LENGTH	380.00	572.20	571.27	596.00	571.34
STD ERROR	0.00	2.31	6.43	0.00	2.77
SAMP SIZE	1	194	26	1	222

[1] Lengths were collected and are reported as rear-orbit to fork of tail.

Table 39. Kogrukluk River escapement of coho salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP	
	43	TOTAL
MALES		
NUMBER	28,241	28,241
PERCENT	72.50	72.50
AV LENGTH	565.32	565.32
STD ERROR	3.45	3.45
SAMP SIZE	79	79
FEMALES		
NUMBER	10,725	10,725
PERCENT	27.50	27.50
AV LENGTH	571.37	571.37
STD ERROR	4.91	4.91
SAMP SIZE	30	30
SEXES COMBINED		
NUMBER	38,966	38,966
PERCENT	100.00	100.00
AV LENGTH	566.99	566.99
STD ERROR	3.86	3.86
SAMP SIZE	109	109

[1] Lengths were collected and are reported as rear-orbit to fork of tail.

Table 40. Salmon River daily chinook salmon escapement counts and estimated total escapement, 1982.

Date	Number
7/14	4
7/15	5
7/16	10
7/17	49
7/18	22
7/19	37
7/20	257
7/21	44
7/22	0
7/23	0
7/24	14
7/25	16
7/26	25
7/27	7
7/28	13
7/29	2
7/30	6
Total	511
Est. Total Escapement	612 [1]

[1] Includes North Fork Salmon River estimated escapement.

Table 41. Salmon River escapement of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP				
	42	52	62	72	TOTAL
MALES					
NUMBER	31	91	173	4	299
PERCENT	5.00	14.90	28.30	0.70	48.90
AV LENGTH	545.43	688.57	846.30	780.00	767.36
STD ERROR	11.87	10.45	8.81	0.00	9.50
SAMP SIZE	7	21	40	1	69
FEMALES					
NUMBER	0	9	261	43	313
PERCENT	0.00	1.40	42.60	7.10	51.10
AV LENGTH	0.00	730.00	807.18	896.30	817.24
STD ERROR	0.00	10.00	6.06	7.75	6.40
SAMP SIZE	0	2	60	10	72
SEXES COMBINED					
NUMBER	31	100	434	47	612
PERCENT	5.00	16.30	70.90	7.80	100.00
AV LENGTH	545.43	692.28	822.87	886.27	792.83
STD ERROR	11.87	10.42	7.16	7.04	7.92
SAMP SIZE	7	23	100	11	141

Table 42. Salmon River escapement of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP		
	41	51	TOTAL
MALES			
PERCENT	62.10	13.80	75.90
AV LENGTH	571.67	620.75	580.59
STD ERROR	7.56	21.96	10.18
SAMP SIZE	18	4	22
FEMALES			
PERCENT	24.10	0.00	24.10
AV LENGTH	544.43	0.00	544.43
STD ERROR	7.58	0.00	7.58
SAMP SIZE	7	0	7
SEXES COMBINED			
PERCENT	86.20	13.80	100.00
AV LENGTH	564.05	620.75	571.88
STD ERROR	7.57	21.96	9.55
SAMP SIZE	25	4	29

Table 43. Quinhagak District (W-4) commercial catch of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP					
	42	52	62	63	72	TOTAL
MALES						
NUMBER	787	7,367	2,075	215	72	10,516
PERCENT	3.60	33.30	9.40	1.00	0.30	47.60
AV LENGTH	531.09	746.94	863.93	763.33	936.00	755.50
STD ERROR	11.87	6.83	13.15	46.39	0.00	9.22
SAMP SIZE	11	103	29	3	1	147
FEMALES						
NUMBER	286	6,868	4,078	143	215	11,590
PERCENT	1.30	31.10	18.40	0.60	1.00	52.40
AV LENGTH	571.50	754.26	873.75	787.50	948.33	795.80
STD ERROR	6.66	6.60	6.05	24.50	19.32	6.86
SAMP SIZE	4	96	57	2	3	162
SEXES COMBINED						
NUMBER	1,073	14,235	6,153	358	287	22,106
PERCENT	4.90	64.40	27.80	1.60	1.30	100.00
AV LENGTH	541.86	750.47	870.44	772.98	945.24	776.63
STD ERROR	10.48	6.72	8.45	37.63	14.49	7.98
SAMP SIZE	15	199	86	5	4	309

Table 44. Quinhagak District (W-4) commercial catch of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP					
	31	41	51	52	61	TOTAL
MALES						
NUMBER	322	8,213	4,509	81	322	13,447
PERCENT	1.00	24.60	13.50	0.20	1.00	40.30
AV LENGTH	533.75	592.82	624.64	608.00	611.50	602.61
STD ERROR	10.69	2.52	4.65	0.00	12.71	3.66
SAMP SIZE	4	102	56	1	4	167
FEMALES						
NUMBER	0	12,684	6,522	0	483	19,889
PERCENT	0.00	38.70	19.60	0.00	1.40	59.60
AV LENGTH	0.00	572.56	584.93	0.00	577.33	576.73
STD ERROR	0.00	1.97	3.49	0.00	12.49	2.73
SAMP SIZE	0	160	81	0	6	247
SEXES COMBINED						
NUMBER	322	21,097	11,031	81	805	33,336
PERCENT	1.00	63.30	33.10	0.20	2.40	100.00
AV LENGTH	533.75	580.45	601.16	608.00	591.00	587.17
STD ERROR	10.69	2.19	3.97	0.00	12.58	3.10
SAMP SIZE	4	262	137	1	10	414

Table 45. Quinhagak District (W-4) commercial catch of sockeye salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	42	52	53	TOTAL
MALES				
NUMBER	4,428	9,743	0	14,171
PERCENT	17.20	38.00	0.00	55.20
AV LENGTH	543.14	583.70	0.00	571.03
STD ERROR	3.27	2.90	0.00	3.02
SAMP SIZE	35	77	0	112
FEMALES				
NUMBER	3,416	7,971	127	11,514
PERCENT	13.30	31.00	0.50	44.80
AV LENGTH	515.11	560.48	519.00	546.56
STD ERROR	4.39	2.18	0.00	2.81
SAMP SIZE	27	63	1	91
SEXES COMBINED				
NUMBER	7,844	17,714	127	25,685
PERCENT	30.50	69.00	0.50	100.00
AV LENGTH	530.93	573.25	519.00	560.06
STD ERROR	3.76	2.58	0.00	2.93
SAMP SIZE	62	140	1	203

Table 46. Quinhagak District (W-4) commercial catch of coho salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	380	32,649	380	33,409
PERCENT	0.50	44.40	0.50	45.40
AV LENGTH	570.00	581.69	561.00	581.32
STD ERROR	0.00	3.89	0.00	3.80
SAMP SIZE	1	86	1	88
FEMALES				
NUMBER	1,898	37,585	759	40,242
PERCENT	2.60	51.00	1.00	54.60
AV LENGTH	553.20	581.58	577.00	580.16
STD ERROR	12.85	2.88	10.00	3.49
SAMP SIZE	5	99	2	106
SEXES COMBINED				
NUMBER	2,278	70,234	1,139	73,651
PERCENT	3.10	95.40	1.50	100.00
AV LENGTH	556.00	581.63	571.66	580.68
STD ERROR	10.71	3.35	6.67	3.63
SAMP SIZE	6	185	3	194

Table 47. Qunihagak area subsistence catch of chinook salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP					
	42	52	62	63	72	TOTAL
MALES						
NUMBER	86	801	225	23	8	1,143
PERCENT	3.60	33.30	9.40	1.00	0.30	47.60
AV LENGTH	531.09	746.94	863.93	763.33	936.00	755.38
FEMALES						
NUMBER	31	746	443	16	23	1,259
PERCENT	1.30	31.10	18.40	0.60	1.00	52.40
AV LENGTH	571.50	754.26	873.75	787.50	948.33	795.77
SEXES COMBINED						
NUMBER	117	1,547	668	39	31	2,402
PERCENT	4.90	64.40	27.80	1.60	1.30	100.00
AV LENGTH	541.80	750.47	870.44	773.25	945.15	776.55

[1] Allocations by sex and age class based on 1982 Quinhagak District commercial catch samples.

Table 48. Quinhagak area subsistence catch of chum salmon, age and length (mm) by sex, 1982[1] [2].

	AGE GROUP					
	31	41	51	52	61	TOTAL
MALES						
NUMBER	21	539	296	5	21	882
PERCENT	1.00	24.60	13.50	0.20	1.00	40.30
AV LENGTH	533.75	592.82	624.64	608.00	611.50	602.62
FEMALES						
NUMBER	0	844	428	0	32	1,304
PERCENT	0.00	38.70	19.60	0.00	1.40	59.60
AV LENGTH	0.00	572.56	584.93	0.00	577.33	576.74
SEXES COMBINED						
NUMBER	21	1,383	724	5	53	2,186
PERCENT	1.00	63.30	33.10	0.20	2.40	100.00
AV LENGTH	533.75	580.46	601.17	608.00	590.87	587.18

[1] Allocations by sex and age class based on 1982 Quinhagak District commercial catch samples.

[2] Includes small numbers of sockeye and pink salmon.

Table 49. Quinhagak area subsistence catch of coho salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	4	382	4	390
PERCENT	0.50	44.40	0.50	45.40
AV LENGTH	570.00	581.69	561.00	581.36
FEMALES				
NUMBER	22	439	9	470
PERCENT	2.60	51.00	1.00	54.60
AV LENGTH	553.20	581.58	577.00	580.16
SEXES COMBINED				
NUMBER	26	821	13	860
PERCENT	3.10	95.40	1.50	100.00
AV LENGTH	555.78	581.63	572.08	580.71

[1] Allocations by sex and age class based on 1982 Quinhagak District commercial catch samples.

Total Harvest:

The 1982 commercial and subsistence harvests in the Quinhagak area totaled 24,508 chinook (Table 50), 35,522 chum (Table 51), 25,685 sockeye, 11,838 pink, and 74,511 coho salmon (Table 52). Chinook, chum, and coho catches were apportioned by sex and age class based on commercial samples from District 4. The largest portion of these total harvests was from the commercial segment as subsistence harvests represented less than 10% of the total harvest of any one species.

Escapement:

All five species of Pacific salmon were counted at a sonar site on the lower Kanektok River as they migrated toward upriver spawning grounds. Sonar counts were apportioned by species daily based upon commercial catch composition (Table 53). Because of the current uncertainty involved in assigning sonar echoes to any particular species, the values presented are considered as preliminary estimates.

Goodnews Area

Age, sex, and size statistics for Goodnews area salmon harvests and escapements were calculated and are presented by category.

District (W-5) Commercial Harvest:

Similar to the age composition observed in the District 4 harvest, the majority of the record 9,481 chinook salmon caught in District 5 were age 5_2 (67%) (Table 54). The commercial harvest of 13,831 chum salmon was the second largest on record and was more evenly split between age 4_1 (46%) and 5_1 (53%) than was apparent in either of the other districts sampled (Table 55). Sockeye salmon catches totaled 38,877 in 1982, and were also the second largest ever documented in this district. Nearly all of the sockeye salmon caught were 3-ocean fish with age 5_2 fish (79%) more abundant than age 6_3 fish (16%) (Table 56). Coho salmon landings were by far the largest ever recorded with 49,284 fish sold. All coho salmon sampled in District 5 were aged as 4_3, although this may be more reflective of the small sample size (n=42) than of the homogeneity of the population age structure (Table 57).

Subsistence:

Subsistence harvests of 1,236 chinook (Table 58), 2,754 chum (Table 59), and 2,692 coho salmon (Table 60) were similar to those reported in the Quinhagak area, but were relatively minor in comparison to those reported in District 1. Since subsistence-caught salmon were not sampled, the basic biological information presented in Tables 58-60 was apportioned directly from the District 5 commercial samples collected.

Total Harvest:

Totals of 10,717 chinook (Table 61), 16,585 chun (Table 62), and 51,976 coho salmon (Table 63) were caught in Goodnews area commercial and subsistence fisheries in 1982. Additionally, 38,887 sockeye and 4,681 pink salmon were harvested commercially in District 5. Combined age compositions presented were again apportioned directly from catch sample data.

Table 50. Quinhagak area total harvest of chinook salmon by age and sex, 1982.

	AGE GROUP					
	42	52	62	63	72	TOTAL
MALES						
NUMBER	872	8,170	2,300	238	79	11,659
PERCENT	3.60	33.30	9.40	1.00	0.30	47.60
FEMALES						
NUMBER	317	7,614	4,521	159	238	12,849
PERCENT	1.30	31.10	18.40	0.60	1.00	52.40
SEXES COMBINED						
NUMBER	1,189	15,784	6,821	397	317	24,508
PERCENT	4.90	64.40	27.80	1.60	1.30	100.00

Table 51. Quinhagak area total harvest of chum salmon by age and sex, 1982[1].

	AGE GROUP					
	31	41	51	52	61	TOTAL
MALES						
NUMBER	343	8,752	4,805	86	343	14,329
PERCENT	1.00	24.60	13.50	0.20	1.00	40.30
FEMALES						
NUMBER	0	13,728	6,950	0	515	21,193
PERCENT	0.00	38.70	19.60	0.00	1.40	59.60
SEXES COMBINED						
NUMBER	343	22,480	11,755	86	858	35,522
PERCENT	1.00	63.30	33.10	0.20	2.40	100.00

[1] Includes small numbers of sockeye and pink salmon.

Table 52. Quinhagak area total harvest of coho salmon by age and sex, 1982.

	AGE GROUP			
	32	43	54	TOTAL
MALES				
NUMBER	384	33,031	384	33,799
PERCENT	0.50	44.40	0.50	45.40
FEMALES				
NUMBER	1,920	38,024	768	40,712
PERCENT	2.60	51.00	1.00	54.60
SEXES COMBINED				
NUMBER	2,304	71,055	1,152	74,511
PERCENT	3.10	95.40	1.50	100.00

Table 53. Kanektok River daily salmon escapement counts by species, 1982.

Date	Chinook	Chum	Sockeye	Coho	Pink
6/20	408	179	129	0	0
6/21	287	125	91	0	0
6/22	222	97	71	0	0
6/23	464	248	232	0	0
6/24	902	481	452	0	0
6/25	1,291	689	648	0	0
6/26	2,220	575	654	0	0
6/27	2,782	721	820	0	0
6/28	2,507	649	739	0	0
6/29	1,590	411	468	0	0
6/30	603	1,033	802	0	3
7/01	629	1,078	836	0	3
7/02	493	844	654	0	3
7/03	350	573	634	0	0
7/04	513	842	929	0	0
7/05	504	827	913	0	0
7/06	497	817	901	0	0
7/07	154	305	493	0	0
7/08	308	613	987	0	0
7/09	410	1,053	1,080	431	0
7/10	242	621	636	254	0
7/11	94	405	323	161	0
7/12	202	868	691	346	0
7/13	205	882	702	351	0
7/14	347	1,892	808	1,218	2
7/15	676	3,684	1,574	2,372	5
7/16	1,367	4,183	2,866	3,026	7
7/17	745	2,281	1,563	1,651	4
7/18	1,087	4,485	2,643	1,249	26
7/19	1,544	6,369	3,574	1,773	36
7/20	605	2,493	1,471	695	14
7/21	334	2,393	1,227	3,867	13
7/22	365	2,617	1,341	4,227	15
7/23	171	1,530	602	3,053	307
7/24	240	2,147	844	4,285	431
7/25	133	1,223	506	4,730	578
7/26	176	1,602	663	6,195	757
7/27	276	2,547	1,053	9,847	1,205
7/28	182	1,675	692	6,473	791
7/29	65	602	248	2,325	284
7/30	119	698	215	2,869	2,540
7/31	123	725	223	2,978	2,637
8/01	121	271	130	1,379	2,981
8/02	39	89	42	452	977
Total	26,592	58,442	37,350	66,216	13,610

Table 54. Goodnews District (W-5) commercial catch of chinook salmon, age and length (mm) by sex, 1982.

	AGE GROUP			
	42	52	62	TOTAL
MALES				
NUMBER	531	3,545	1,064	5,140
PERCENT	5.60	37.40	11.20	54.20
AV LENGTH	530.33	752.58	888.25	757.68
STD ERROR	16.53	10.38	16.73	12.33
SAMP SIZE	6	40	12	58
FEMALES				
NUMBER	266	2,834	1,241	4,341
PERCENT	2.80	29.90	13.10	45.80
AV LENGTH	617.67	728.56	857.36	758.57
STD ERROR	61.71	12.26	14.40	15.90
SAMP SIZE	3	32	14	49
SEXES COMBINED				
NUMBER	797	6,379	2,305	9,481
PERCENT	8.40	67.30	24.30	100.00
AV LENGTH	559.48	741.91	871.62	758.09
STD ERROR	31.59	11.22	15.48	13.97
SAMP SIZE	9	72	26	107

Table 55. Goodnews District (W-5) commercial catch of chum salmon, age and length (mm) by sex, 1982.

	AGE GROUP				
	31	41	51	61	TOTAL
MALES					
NUMBER	0	2,254	2,765	0	5,019
PERCENT	0.00	16.30	20.00	0.00	36.30
AV LENGTH	0.00	598.27	616.07	0.00	608.08
STD ERROR	0.00	5.87	5.56	0.00	5.70
SAMP SIZE	0	22	27	0	49
FEMALES					
NUMBER	102	4,098	4,510	102	8,812
PERCENT	0.70	29.60	32.70	0.70	73.70
AV LENGTH	521.00	570.30	593.64	609.00	582.12
STD ERROR	0.00	4.04	3.98	0.00	3.92
SAMP SIZE	1	40	44	1	86
SEXES COMBINED					
NUMBER	102	6,352	7,275	102	13,831
PERCENT	0.70	45.90	52.70	0.70	100.00
AV LENGTH	521.00	580.23	602.17	609.00	591.54
STD ERROR	0.00	4.69	4.58	0.00	4.56
SAMP SIZE	1	62	71	1	135

Table 56. Goodnews District (W-5) commercial catch of sockeye salmon age and length (mm) by sex, 1982.

	AGE GROUP			
	42	52	63	TOTAL
MALES				
NUMBER	1,525	16,770	4,193	22,488
PERCENT	3.90	43.10	10.80	57.80
AV LENGTH	531.25	596.05	614.09	595.02
STD ERROR	9.04	3.06	4.88	3.81
SAMP SIZE	4	44	11	59
FEMALES				
NUMBER	381	14,103	1,905	16,389
PERCENT	1.00	36.30	4.90	42.20
AV LENGTH	500.00	566.41	592.00	567.84
STD ERROR	0.00	3.03	10.26	3.80
SAMP SIZE	1	37	5	43
SEXES COMBINED				
NUMBER	1,906	30,873	6,098	38,877
PERCENT	4.90	79.40	15.70	100.00
AV LENGTH	525.00	582.51	607.19	583.56
STD ERROR	7.23	3.05	6.57	3.81
SAMP SIZE	5	81	16	102

Table 57. Goodnews District (W-5) commercial catch of coho age and length (mm) by sex, 1982.

	AGE GROUP	
	43	TOTAL
MALES		
NUMBER	23,469	23,469
PERCENT	47.60	47.60
AV LENGTH	597.55	597.55
STD ERROR	8.62	8.62
SAMP SIZE	20	20
FEMALES		
NUMBER	25,815	25,815
PERCENT	52.40	52.40
AV LENGTH	601.09	601.09
STD ERROR	6.48	6.48
SAMP SIZE	22	22
SEXES COMBINED		
NUMBER	49,284	49,284
PERCENT	100.00	100.00
AV LENGTH	599.40	599.40
STD ERROR	7.50	7.50
SAMP SIZE	42	42

Table 58. Goodnews area subsistence catch of chinook salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP			
	42	52	62	TOTAL
MALES				
NUMBER	69	462	139	670
PERCENT	5.60	37.40	11.20	54.20
AV LENGTH	530.33	752.58	888.25	757.84
FEMALES				
NUMBER	35	369	162	566
PERCENT	2.80	29.90	13.10	45.80
AV LENGTH	617.67	728.56	857.36	758.57
SEXES COMBINED				
NUMBER	104	831	301	1,236
PERCENT	8.40	67.30	24.30	100.00
AV LENGTH	559.72	741.91	871.62	758.17

[1] Allocations by sex and age class based on 1982 Goodnews District commercial catch samples.

Table 59. Goodnews area subsistence catch of chum salmon, age and length (mm) by sex, 1982[1].

	AGE GROUP				
	31	41	51	61	TOTAL
MALES					
NUMBER	0	449	551	0	1,000
PERCENT	0.00	16.30	20.00	0.00	36.30
AV LENGTH	0.00	598.27	616.07	0.00	608.08
FEMALES					
NUMBER	20	816	898	20	1,754
PERCENT	0.70	29.60	32.70	0.70	73.70
AV LENGTH	521.00	570.30	593.64	609.00	582.13
SEXES COMBINED					
NUMBER	20	1,265	1,449	20	2,754
PERCENT	0.70	45.90	52.70	0.70	100.00
AV LENGTH	521.00	580.23	602.17	609.00	591.55

[1] Allocations by sex and age class based on 1982 Goodnews District commercial catch samples.

Table 60. Goodnews area subsistence catch of coho salmon age and length (mm) by sex, 1982[1].

	AGE GROUP	
	43	TOTAL
MALES		
NUMBER	1,282	1,282
PERCENT	47.60	47.60
AV LENGTH	597.55	597.55
FEMALES		
NUMBER	1,410	1,410
PERCENT	52.40	52.40
AV LENGTH	601.09	601.09
SEXES COMBINED		
NUMBER	2,692	2,692
PERCENT	100.00	100.00
AV LENGTH	599.40	599.40

[1] Allocations by sex and age class based on 1982 Goodnews District commercial catch samples.

Table 61. Goodnews area total harvest of chinook salmon by age and sex, 1982.

	AGE GROUP			
	42	52	62	TOTAL
MALES				
NUMBER	600	4,007	1,203	5,810
PERCENT	5.60	37.40	11.20	54.20
FEMALES				
NUMBER	301	3,203	1,403	4,907
PERCENT	2.80	29.90	13.10	45.80
SEXES COMBINED				
NUMBER	901	7,210	2,606	10,717
PERCENT	8.40	67.30	24.30	100.00

Table 62. Goodnews area total harvest of chum salmon by age and sex, 1982.

	AGE GROUP				
	31	41	51	61	TOTAL
MALES					
NUMBER	0	2,703	3,316	0	6,019
PERCENT	0.00	16.30	20.00	0.00	36.30
FEMALES					
NUMBER	122	4,914	5,408	122	10,566
PERCENT	0.70	29.60	32.70	0.70	73.70
SEXES COMBINED					
NUMBER	122	7,617	8,724	122	16,585
PERCENT	0.70	45.90	52.70	0.70	100.00

Table 63. Goodnews area total harvest of coho salmon by age and sex, 1982.

	AGE GROUP	
	43	TOTAL
MALES		
NUMBER	24,751	24,751
PERCENT	47.60	47.60
FEMALES		
NUMBER	27,225	27,225
PERCENT	52.40	52.40
SEXES COMBINED		
NUMBER	51,976	51,976
PERCENT	100.00	100.00

Escapement:

Salmon migrating up the Middle Fork of the Goodnews River were counted from a tower in 1982. Total escapements of chinook, chum, and sockeye salmon were documented at 1,395, 6,767, and 56,255 fish respectively (Table 64).

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Table 64. Middle Fork of the Goodnews Bay daily salmon escapement counts by species, 1982.

Date	Chinook	Chum	Sockeye
6/23	0	0	1,822
6/24	22	42	4,201
6/25	28	141	6,010
6/26	4	163	5,019
6/27	2	82	2,559
6/28	0	0	98
6/29	0	4	268
6/30	0	8	438
7/01	0	12	608
7/02	3	6	675
7/03	2	30	966
7/04	23	65	2,328
7/05	44	100	3,690
7/06	11	47	2,755
7/07	24	27	1,578
7/08	44	126	2,912
7/09	50	326	4,382
7/10	26	224	2,364
7/11	66	308	2,194
7/12	106	391	2,023
7/13	104	339	1,319
7/14	49	490	1,567
7/15	85	371	1,097
7/16	117	380	1,513
7/17	96	212	785
7/18	59	167	534
7/19	22	122	282
7/20	39	193	385
7/21	55	175	238
7/22	34	197	202
7/23	33	219	187
7/24	32	242	152
7/25	31	264	177
7/26	31	286	142
7/27	19	204	120
7/28	36	116	90
7/29	16	132	73
7/30	13	83	83
7/31	29	74	92
8/01	17	104	109
8/02	5	134	126
8/03	18	161	92
Totals	1,395	6,767	56,255

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